

Message Text

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DISTO

FOLLOWING TEL SENT ACTION SECSTATE WASHDC INFO LONDON, BOMBAY,
CALCUTTA, MADRAS FROM NEW DELHI MAY 19:

QUOTE LIMITED OFFICIAL USE NEW DELHI 6607

LONDON FOR AMBASSADOR MOYNIHAN

E.O. 11652: N/A

TAGS: TECH, IN

SUBJECT: INDIAN NUCLEAR EXPLOSION - SOME TECHNICAL ASPECTS

1. MR. HOMI SETHNA, CHAIRMAN OF INDIA'S ATOMIC ENERGY
COMMISSION, ANNOUNCED AT A PRESS INTERVIEW ON THE EVENING OF
MAY 18 THAT THE UNDERGROUND NUCLEAR DEVICE EXPLODED IN WESTERN
RAJASTHAN AT 8:05 A.M. SATURDAY, MAY 18, WAS IN PURSUANCE OF
THE GOI INTENTION TO KEEP ABREAST OF DEVELOPMENTS IN NUCLEAR
TECHNOLOGY. SETHNA SAID THIS WAS PURELY A SCIENTIFIC EXPERI-
MENT AND PARTICULARLY MENTIONED ITS USE IN MINING AND EARTH-
MOVING OPERATIONS.

2. ACCORDING TO SETHNA THE NUCLEAR DEVICE WAS EXPLODED BY A LOW-
YIELD

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PLUTONIUM DEVICE AT A DEPTH OF ABOUT 100 METERS. THE MAGNITUDE OF

THE
EXPLOSION WAS BETWEEN 10 AND 15 KILOTONS (15,000 TONS OF
TNT, SOMEWHAT SMALLER IN SIZE THAN THE HOROSHIMA BLAST
WHICH WAS ABOUT 20 KILOTONS). SETHNA SAID THERE WAS NO NUCLEAR FALL-
OUT AND THAT THE EXPLOSION WAS TOTALLY CONTAINED. IT HAD THROWN SOME
ROCKS AND SAND OVER THE SURFACE WHICH WERE CHASED FOR 10 TO 15
KILOMETERS BY A HELICOPTER THROUGH 30-MILE-AN-HOUR WINDS, BUT NO
SIGNIFICANT RADIOACTIVITY WAS DETECTED. ABOUT 90 MINUTES AFTER
DETONATION, A MOBILE TEAM REACHED THE DISTANCE OF 200 METERS FROM THE
EXPLOSION SITE AND DETECTED NO SIGNIFICANT RADIOACTIVITY. THE
EXPERIMENT WAS CONSIDERED SUCCESSFUL, BOTH IN TERMS OF THE
CRATERING EFFECT AND THE EXTENT OF SUBSTRUCTURE CRACKING; I.E.,
HOW FAR IT HELPED CRUSH ROCKS IN THE SUBSTRUCTURE. SETHNA SAID THAT
THIS WOULD BE ESSENTIAL IN FUTURE EXPLORATION TO INCREASE GAS AND OIL
YIELDS. THERE WAS NO CRATERING TO SPEAK OF. SEISMOLOGICAL INSTRU-
MENTS WERE SET UP IN STRATEGIC LOCATIONS TO DETECT SHOCK WAVES.
ALSO,
MICROBAROGRAPHS WERE PLACED FOR VENTING READINGS. NONE OF THE
MICROBAROGRAPHS SHOWED ANY READING, REPORTED SETHNA.

3. IN REPLY TO A QUESTION ABOUT A TIME FRAME, SETHNA REPLIED
IT WAS A QUESTION OF SETTING UP THE EXPERIMENT AND APPLYING IT
UNDER CERTAIN STRATEGIC CONDITONS. HE FELT THAT FURTHER
SCIENTIFIC EXPERIMENTS OF THIS SORT WOULD BE NECESSARY FOR
FURTHER RESEARCH INTO THESE MATTERS. THEY WOULD HAVE TO FIND
OUT DEFINITE USE FOR THE EXPLOSIONS. ALL OF THIS WOULD BE
ANALYZED AND WILL TAKE SOME TIME. HE HOPED TO PUBLISH THE
RESULTS SHORTLY.

4. SETHNA WENT ON TO SAY THE NUCLEAR DEVICE WAS INDIAN MADE
AND TRIGGERED BY USING AN IMPLSION TECHNIQUE. THIS IS DONE BY
FORCING THE PLUTONIUM FISSION MATERIAL INWARDS, CREATING A
MASSIVE FORCE EXPLOSION. THIS TECHNIQUE INVOLVES COMPRESSING
SEVERAL TIMES THE NORMAL DENSITY, THE MASS OF FISSIONABLE
PRODUCT. IT REQUIRES A PRESSURE OF ABOUT 10 MILLION POUNDS PER
SQUARE INCH. THESE PRESSURES ARE DEVELOPED THROUGH USE OF HIGH
EXPLOSIVES.

5. A MAJOR PROBLEM TO BE SOLVED IN THESE LOW-YIELD UNDERGROUND
BLASTS IS TO REDUCE THE RADIOACTIVITY AND TO INCREASE THE HEAT
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AND BLAST EFFECTS. THE DIRECTION OF EFFORT IN THIS RESPECT IS
THE SAME AS THAT INVOLVED IN MAKING MORE EFFICIENT AND CLEAN
WEAPONS. LARGE-SIZED THERMONUCLEAR EXPLOSIONS ARE MORE ECONOMICAL.

6. IN ANSWER TO A QUESTION ABOUT THE TIME TAKEN TO PREPARE FOR
THE TESTS, DR. SETHNA INDICATED THAT THE PLUTONIUM USED FOR THE
EXPLOSION WAS "100 PERCENT INDIAN MADE", AND THAT THE COUNTRY
BEGAN MAKING PLUTONIUM AS FAR BACK AS 1964. HE SAID THAT THE

PURNIMA RESEARCH REACTOR (INDIA'S FOURTH REACTOR) BECAME CRITICAL IN 1972. THIS REACTOR IS FUELED WITH PLUTONIUM AND WAS BUILT INDIGENOUSLY BY INDIAN SCIENTISTS AT BHABHA ATOMIC RESEARCH CENTER. IT HAS A PLUTONIUM CORE SPLIT IN TWO PARTS--ONE STATIC AND ONE MOVING. THIS WORKS ON THE REVOLVING-TABLE PRINCIPLE AT A SPEED OF SEVERAL THOUSAND REVOLUTIONS PER MINUTE, RESULTING IN A SMALL ATOMIC EXPLOSION EACH TIME THE MOVING CORE COMES INTO CONTACT WITH THE STATIC CORE. INDIA HAS RULED OUT THE CONVENTIONAL URANIUM DEVICE BECAUSE THEY DO NOT HAVE A URANIUM ENRICHMENT PLANT. THIS, IT IS FELT, IS NOT TOO COSTLY, ALTHOUGH IT WAS ENVISIONED BY FORMER AEC CHAIRMAN VIKRAM SARABHAI FOR THE INDIAN FOURTH PLAN. THIS, HOWEVER, HAS NOT DEVELOPED.

7. INDIAN PRESS STORIES (NOT CONFIRMED BY SETHNA) ASSUMED THAT THE PLUTONIUM 239 USED IN THIS DEVICE WAS WASTE FROM THE INDO-CANADIAN CIRUS REACTOR AT TROMBAY OR THE TWO IN RAJASTHAN, BUT NOT THE INDO-US TARAPUR REACTOR WHICH HAS A HIGH CONTENT OF ISOTOPE PLUTONIUM 240 WHICH MAKES IT LESS EFFICIENT FOR USE IN NUCLEAR EXPLOSIONS. THE PLANT AT TROMBAY TO RECOVER PLUTONIUM FROM THE FUEL OF THE CIRUS REACTOR WAS BUILT IN 1964 BY ENGINEERS AT THE BHABHA ATOMIC RESEARCH CENTER. BASED ON THIS EXPERIENCE, THE AEC IS NOW BUILDING A LARGE PLUTONIUM RECOVERY PLANT AT TARAPUR AND THE TWO RAJASTHAN ATOMIC POWER STATIONS.

8. THE INFORMATION IN THIS TELEGRAM HAS BEEN MADE PUBLIC IN THE INDIAN PRESS AND RADIO. THE LIMITED OFFICIAL USE CLASSIFICATION IS FOR DISTRIBUTION PURPOSES ONLY. SCHNEIDER UNQUOTE
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